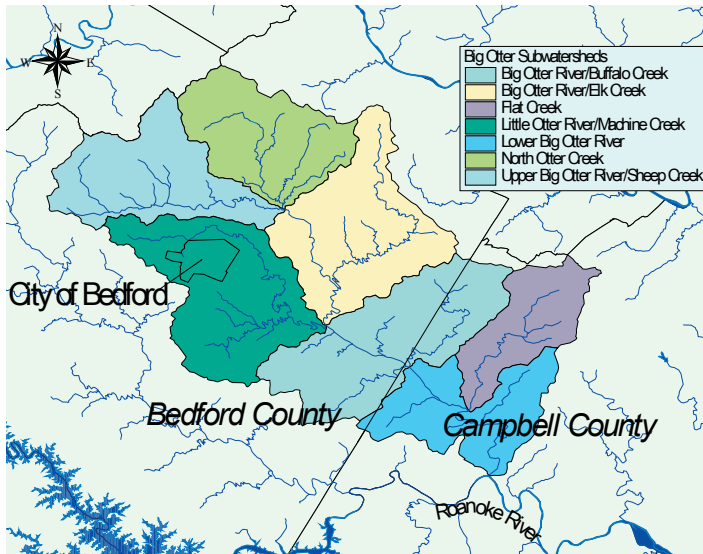


# The Big Otter Watershed Clean-Up Plan



Big Otter sub-watersheds

## The Water Quality Study

A water quality study was completed for Sheep, Elk, and Machine Creeks, and Little Otter and Lower Big Otter Rivers in 2000. This study was conducted after water quality monitoring performed by the Virginia Department of Environmental Quality showed that these streams were violating water quality standards for fecal coliform bacteria. When these standards are violated, people face an increased risk of illness or infection through primary contact with the water including swimming. These streams were added to Virginia's list of "dirty" or impaired waters due to violations of the fecal coliform water quality standard. The study set Total Maximum Daily Loads (TMDLs) for bacteria in each stream that if attained would meet water quality standards. The study also identified the pollutant reductions needed from various sources within each of the subwatersheds (drainage areas) for each impaired stream to meet the goals.

## The Pollution Sources



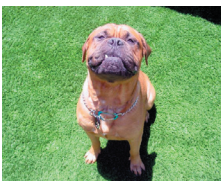
### Point sources:

Wastewater treatment plants and other industries may discharge bacteria at or below their permitted levels.



### Urban and residential development:

Malfunctioning septic systems and straight pipes (directly discharging untreated sewage into the water) contribute bacteria to our streams



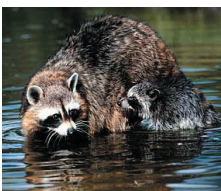
### Pets:

Dogs and cats contribute fecal coliform to our streams. When pet waste is left in parks and yards, it is carried to streams through runoff.



### Agriculture:

Cattle, horses and sheep contribute fecal coliform through direct deposition of waste into the water, and through improper manure application.



### Wildlife:

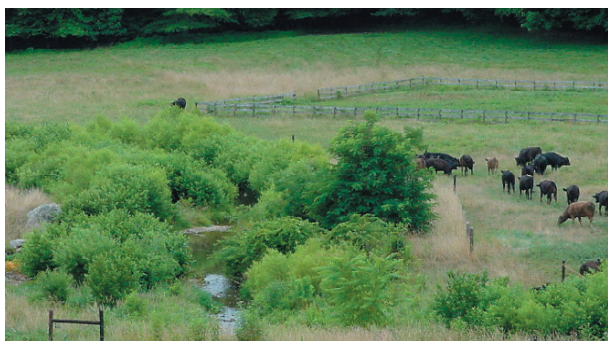
Wildlife contribute fecal coliform to our streams through their waste. This is typically a naturally occurring source of bacteria.

## The Clean-Up Plan: Big Otter TMDL Implementation Plan

After the TMDL study was completed, an implementation or clean-up plan was developed to reduce the amount of pollution from each of the identified pollutant sources. Two additional streams were included in this plan, North Otter and Buffalo Creeks, after water quality monitoring conducted between 1996 and 2002 showed that they were also violating fecal coliform standards. Local citizens and representatives from the following groups and agencies have been involved in the Big Otter clean-up plan: The Peaks of Otter and Robert E. Lee Conservation Districts (POCD, RELCD), The City of Bedford, Bedford and Campbell Counties, Natural Resource Conservation Service, Virginia Departments of Health, Conservation and Recreation (DCR), and Environmental Quality (DEQ). All the groups involved worked together to identify best management practices (BMPs), which are conservation measures to improve soil and water quality, to include in the plan. Some examples of BMPs include riparian buffers, rotational grazing, and maintaining septic systems so they remove nutrients and bacteria efficiently. A bi-monthly water quality monitoring program is included in this plan, which DEQ will use to assess progress in implementing the plan and to determine whether its goals are achieved. The POCD will work together with the RELCD and local stakeholders to implement the clean-up plan.

## Best Management Practices

The following Best Management Practices (BMPs) were selected for the Clean-Up Plan for the Big Otter watershed by residential and agricultural working groups and a representative steering committee. Implementation goals were established for each of the practices listed below. Financial assistance is available for BMP installation through the Virginia State Cost Share Program. Several additional BMPs are listed below that were not included in the clean-up plan; however, implementing these practices will also help to decrease fecal coliform concentrations in our streams. Landowners will have the opportunity to discuss their options with qualified staff members, who will help them select BMPs that best suit their needs. Progress will be assessed by regular monitoring by DEQ and citizen programs. Based on progress at the end of 5 years, it will be determined whether additional implementation efforts are necessary to meet the Clean-up Plan goals.



Exclusion fencing and streamside buffer



Straight pipe discharging raw sewage into stream. This pipe should be replaced with a septic system.



A raingarden installed in a residential area catching runoff from the yard, driveway and road.

### What you can do?

- Learn more about financial incentives available to install Best Management Practices
- Implement Best Management Practices on your property
- Get involved with local civic and watershed organizations
- Give a copy of this fact sheet to your neighbor

### Agricultural Best Management Practices

**Grazing Land and Stream Protection Systems:** Establish streamside fencing and buffers to trap pollutants. Stream exclusion systems may also include off stream watering. Having a clean water source can prevent illnesses that reduce livestock production.

**Improved Pasture Management:** Includes rotational grazing systems, soil testing, nutrient management and improving forage species. Agricultural producers can benefit through reduced feeding costs for livestock and potentially higher stocking rates.

### Residential Best Management Practices

**Septic System Maintenance, Repair and Replacement:** Includes the repair or replacement of failing systems, installation of alternative systems where conventional systems are not appropriate, and the replacement of straight pipes with appropriate treatment systems. Homeowners benefit by receiving both technical and financial assistance with septic system maintenance, and potentially extending the life of their septic system by following a proper maintenance schedule.

### Additional BMP's to Reduce Fecal Coliform

**Waste Storage Facilities:** Facilities to store waste from poultry and livestock until the appropriate time for fertilization.

**Nutrient Management Plans:** These plans provide guidance on manure application based on soil chemistry and seasonal plant nutrient requirements in rural and urban areas

**Rain Gardens:** Gardens designed to collect and filter water and reduce the amount of pollutants carried to streams in stormwater. These can be installed in residential and commercial areas, and can be easily incorporated into existing landscaping.

### For more information contact:

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